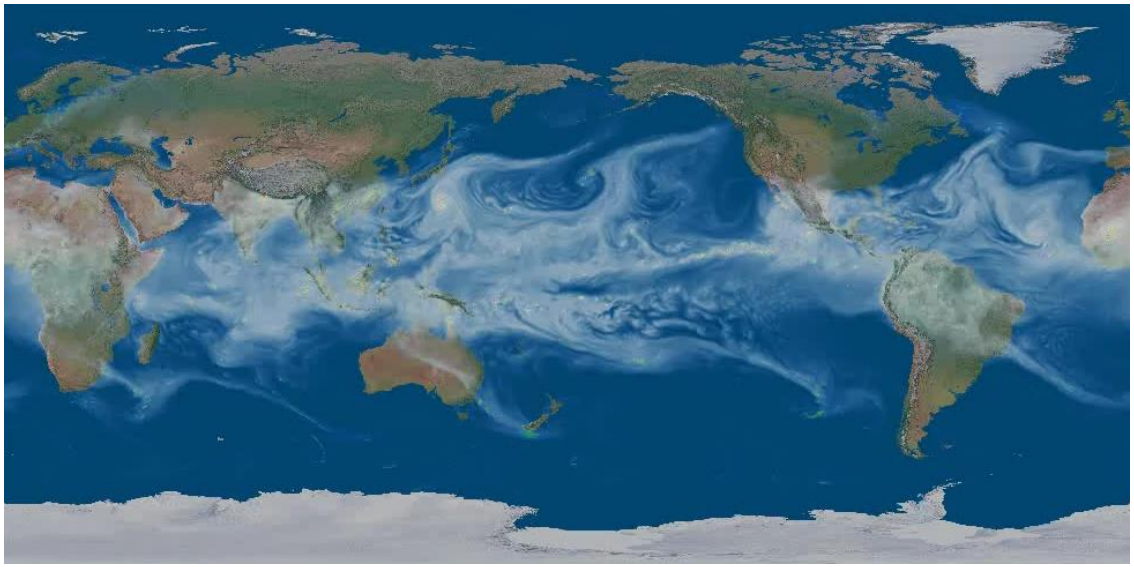
Sandia National Laboratories



Peter Davies
Director -- Geoscience, Climate and Consequence Effects
BERAC Meeting
March 22-23, 2016

Sandia National Laboratories

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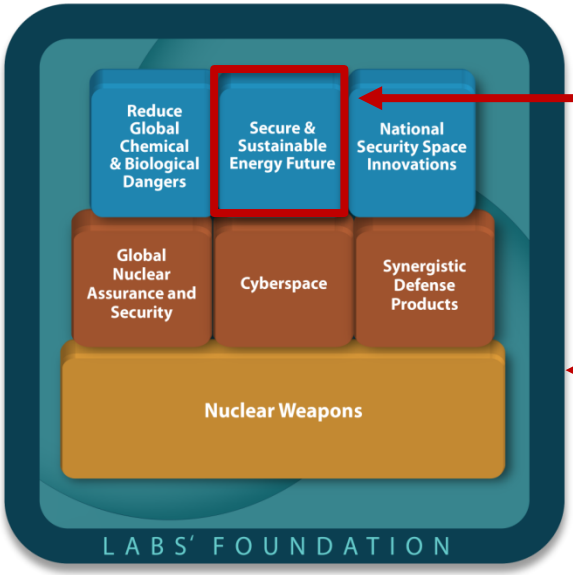
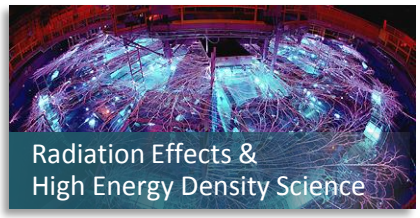
Sandia Mission/Research Framework

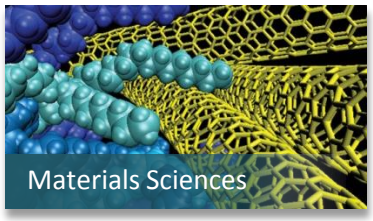
Seven Mission Areas draw from and contribute to Lab's Foundation

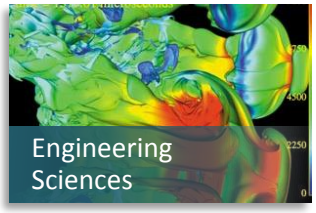


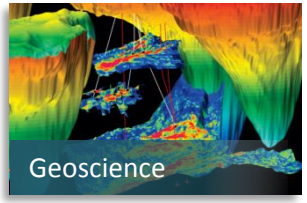
***Secure & Sustainable Energy Future** -- Science-based understanding of the complex interdependencies between energy and climate*

***Lab's Foundation** -- Seven Research Foundations, Office of Science Research and major computational and experimental capabilities*







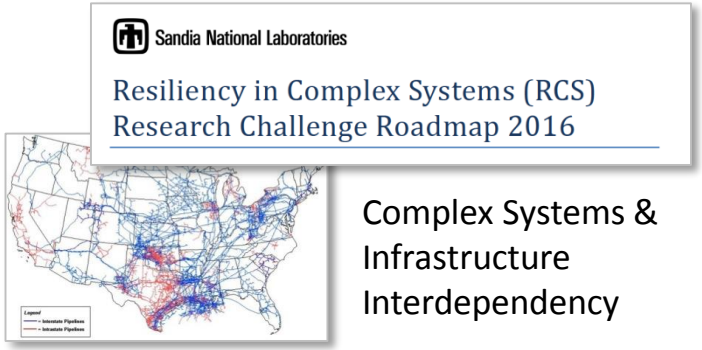


BER Related Research Capabilities & Facilities

BER-related core research capabilities

- **Computer Science, Future Computing Environments & Uncertainty Quantification**
- **Geo and Atmospheric Science**
- **Complex Systems, Energy-Water Systems, Infrastructure Interdependency**
- **Biosciences**

Computer Science



Complex Systems & Infrastructure Interdependency

BER-related core facilities

Joint Bioenergy Institute

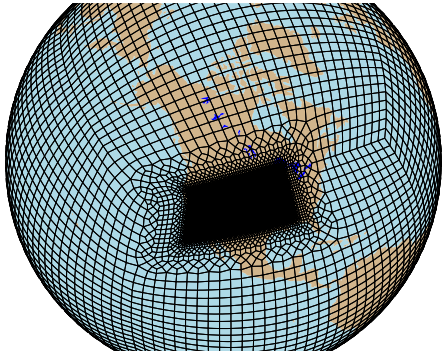
Center for Integrated Nanotechnologies

Combustion Research Facility

Arctic ARM Sites

Microsystems & Engineering Sciences Applications (MESA)

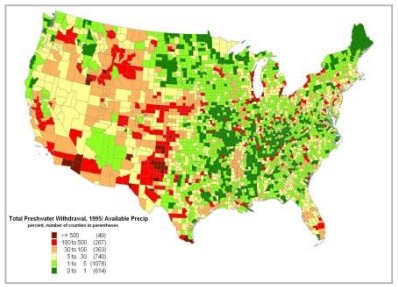
Major Strategic Science Priorities



Enable ultra high resolution climate models with tightly coupled uncertainty quantification, local scale models of infrastructure impacts, and calibration with global and local scale air/sea/ice/land measurements

Develop innovative methods to measure and integrate multi-scale air/sea/ice/land processes and parameters, including GHG emissions

Develop integrated data sets, tightly coupled models of complex climate, energy and infrastructure systems (including uncertainty quantification)



Develop systems-level understanding of microbes and communities, leading to cost-effective biomass conversion technologies

Future Strategic Partnerships

Grand challenge scale problems intrinsically require multi-institutional scale partnerships – future research challenges will require even deeper cross institutional partnerships

National Labs

Universities

Agencies

Industry

International

Present example – JBEI Biomaterials

Present Example – Arctic ARM Climate Research Facilities

Present Example – ACME Climate Model